Summary of Independence Room Research Subgroup Discussion

DOMAINS

Curriculum and Instruction

Issues

1. How to compare C & I programs
2. Determining the elements of a good educational research design
3. How to synthesize small-scale studies that have been carried out
4. Do we know how to teach learners in special education?

Ideal (for Issue #1) – arrive at consensus about results of research in these areas

Barriers (for Issue #1)

- No one solution or program will work for everyone
- Different paths possible for getting to the same goal
- Lack of coherent theory
- Lack of agreement about goals of math ed
- Lack of informed parental input
- Vast differences in settings and programs

Opportunities for Coordination (for Issue #1)

- Bring parents, mathematicians, and math educators together
- Methods of communication
  -- Need sustained communication

Strategies (What) (for Issue #1)

- Neutral forums for continuing the dialogue
- NAS/NRC
- School boards
- PTA meetings
- The general public

Cognitive Foundations of Mathematical Competency

Issues

1. Evolution of math concepts over time for the individual learner
2. Content and organization of math concepts (i.e., understanding of relations among concepts)
3. Issues of symbolic representation, including natural language, tables, graphs, notation; relation between internal and external representations
4. Social interaction and communication norms and engagement

Ideal (for Issues 2 & 3 combined)

- What are the cognitive processes and empirical findings related to key concepts and contents in math?

Barriers (for Issues 2 & 3 combined)

- Sense of isolation of different realms of research
- Divergent views as to what constitutes evidence of understanding (i.e., what constitutes valid research?)
- Limited education of researchers themselves
  -- (emphasis on basic research?)
- Pressure that results of research should be immediately usable
- Framing the most "effective"? (appropriate?) research questions

Assessment

Issues

- How can mathematical learning be adequately assessed, and what kinds of assessment be used to advance student learning?
  -- Use of assessment for testing teacher knowledge of mathematics
  -- Integration of assessment and curriculum (i.e., embedded assessment)

Ideal

- Valid assessments that lead to valid inferences about what students know
  -- Provide feedback to students, teachers, and researchers

Barriers

- Sloppy use of language (e.g., testing, assessment, evaluation)
- Professional development for teacher in use of assessment
- "Scientifically-based research" is too narrowly focused
- Assessments often take over (precedence?), especially high stakes "assessment"
- Quality of available assessments

Opportunities for Coordination

- Bringing people together who have developed or are developing assessments
- Building an assessment system around learning goals and testing it out
- Types of questions used
- Adaptive assessment
  -- Use of technology